Accelerated Site Technology Deployment

Fact Sheet

INTEGRATED DECONTAMINATION AND DECOMMISSIONING PROJECT

Idaho National Engineering and Environmental Laboratory
In Partnership with the Office of Science & Technology

Need

Surplus DOE facilities with radioactive and hazardous contamination span the range of construction techniques from concrete block to structural steel to massive cast-in-place, steel-reinforced concrete. They often contain large amounts of steel piping and equipment. These facilities need to be decontaminated and decommissioned (D&D) for other uses and to reduce the number of facilities requiring surveillance and maintenance. New technologies exist that could D&D these facilities more efficiently than the currently used baseline methods, but the risks inherent in using untried methods tend to encourage traditional technologies.

Technology Description

A broad-ranging ASTD project targeting this problem is the Integrated Decontamination and Decommissioning (ID&D) suite of technologies, a combined effort of the D&D Focus Area through the National Energy Technology Laboratory (NETL), Idaho National Engineering and Environmental Laboratory (INEEL), Fernald Environmental Management Project (FEMP), and Argonne National Laboratory-East (ANL-E). This project is increasing the use of innovative yet proven technologies on a large scale in the D&D of facilities across the DOE Complex. These three sites are integrating their efforts through joint planning and reporting, regular communication, and sharing of technical information and lessons learned.

The ID&D technologies deployed at INEEL, FEMP and ANL-E are being deployed as a system to address the many diverse applications for contaminated structures. The suite currently consists of the following technologies:

BROKK BM 250—Small, remote-controlled demolition equipment with a hydraulic boom extending 15 feet, to which multiple end effectors may be attached.

Decontamination, Decommissioning, and Remediation Optimal Planning System (DDROPS)—A pre-planning tool that optimizes cutting and waste box packing.

Lead Paint Analyzer— Handheld device for real-time detection of metals in paint.

Spectro Xepos XRF Analyzer—Bench-top characterization equipment that detects several elements in samples, including chlorine, a possible PCB indicator.

Personal Ice Cooling Suit System—A suit with tubing through which ice-cold water is circulated by a battery-powered pump to keep workers cool when wearing Personal Protective Equipment.

Surveillance and Measurement System (SAMS)—A characterization device that provides isotopic information using a thallium-activated sodium iodide detector.

Soft-Sided Waste Containers—Flexible Low Level Waste containers that hold 3-4 times as much waste as a box and cost half as much; flexibility of the containers reduces landfill subsidence.

Excel Modular Scaffolding—Versatile scaffolding that snaps together so workers

do not need to tighten clamps by hand or spend time leveling scaffolding.

GammaCam™—A characterization device that imposes a visual display of radiation on a real-time black and white image of the area.

Oxy-Gasoline Cutting Torch—A faster, less

expensive tool for cutting carbon steel.

Hand-held Shear—Used to remove/size smaller pipes and other thin metal structures by an individual operator.

Track Mounted Shear—Mobile demolition for large structures.

Paint Scaler—A hand-held, battery-operated drill with chisel attachments for rapid sample collection.

Global Positioning Radiometric Scanner System (GPRS)—Detectors attached at a height of 3 feet to the front of a 4-wheel drive vehicle to rapidly survey large

areas for radioactive contamination.

En-Vac Robotic Wall Scabbler—Robotic abrasive grit blasting scabbling system that removes contamination from concrete or metal walls; attaches to the wall with high vacuum suction.

Benefits

The ASTD ID&D project has been a huge success. The technology suite has replaced traditional baseline technologies at all three sites, resulting in cost and schedule improvements during D&D operations at several DOE facilities. Throughout the project, engineering and D&D Operations worked closely to integrate their efforts as a team, which was a key factor in the success of the project. They focused on selecting technologies that meet large needs and provided the most bang for the buck. In addition, they used innovative approaches when calculating cost benefit analyses to minimize data collection while maintaining accuracy. In doing so, they kept the project focused on deploying as many technologies as possible that are useful and provide large benefits.

Significant accomplishments of ID&D at FEMP include deploying three technologies (Hand-held Shear, Oxy-Gas Torch and Track Mounted Shear) and removal of nine structures. FEMP has reported a cost savings of $200K to date. They estimate an additional savings of $7.8M for 23 buildings. FEMP will continue deployments during D&D activities.

The technology used at ANL-E has accomplished removal of the CP-5 reactor bioshield. Two BROKK demolition units worked in tandem and accomplished the task with significantly reduced radiation dose to workers.

Status

At the INEEL, 15 technologies have been deployed and are being used to provide assistance with D&D of 25 different facilities for a total of 66 deployments saving $797K. INEEL's cost savings are estimated at $25.6M over the next 10 years.

Other sites (Savannah River, Rocky Flats, Hanford, Pantex, Ashtabula, Mound and Oak Ridge) are considering use of all or some of the ASTD ID&D technologies.

For more information on technologies deployed at INEEL, contact:

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